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Filing Date	July 31, 2003
First Named Inventor	Youngpeter, Bryan
Art Unit	3746
Examiner Name	Freay, Charles Grant
Attorney Docket Number	81131517 (19278)

ENCLOSURES (Check all that apply)

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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Paul K. Godwin, PC		
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10/631,129

PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before The Board of Patent Appeals and Interferences

Appellants: Youngpeter, Bryan; et al

Group Art Unit: 3746

Serial No: 10/631,129

Examiner: Freay, Charles Grant

Filed: July 31, 2003

Title: Power Steering Pump Having Electronic ByPass Control

REPLY BRIEF

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

This Reply Brief is being submitted in response to the Examiner's Answer dated September 4, 2008.

Status of Claims page 2.

Grounds of rejection to be reviewed on appeal page 3.

Argument pages 4-11.

STATUS OF CLAIMS

Claims in the application: 7-11

Claims cancelled: 1 - 6

Claims rejected: 7 -11

Claims being appealed: 7-11

GROUND OF REJECTION

Rejection of Claims 7-11 under 35 USC 103(a) as being unpatentable over Fujimura, et al 5,860,797 in view of Duffy 4,877,099.

ARGUMENT

In the Examiner's Answer section (9) stating the grounds of rejection, there are several errors.

On page 4, lines 8 and 11 of the Examiner's Answer there are erroneous references to "valve section 16d" in Fujimura et al. Element "16d" is a spring (col. 4, line 12). Appellants believe that the Examiner meant to refer to "16b" which is described in Fujimura et al as a "valve section" (col. 4, line 8).

In further discussion of Fujimura et al on page 4, line 15, the Examiner's Answer refers to a "sleeve (18)". In Fujimura et al elements "plug 18" and "sleeve 19" are mentioned, but no sleeve 18 (col. 3 lines 55+). It is not clear which element is intended by the Examiner.

In the discussion of Duffy on page 5, lines 13 and 14, the Examiner's Answer includes a statement that the "...plunger (62) is responsive to an applied electromagnetic field generated by a coil (60) to proportionally control the fluid communicated to the bypass port (56) which communicates to the pump inlet." (emphasis added). It should be pointed out that this is the first time the Examiner has made such an allegation and that there is no support for that concept in Duffy. The words "proportional" or "proportionally" are not used anywhere in Duffy to describe the system and valve therein. Duffy's description of a proportional concept is with respect to a prior art patent having speed sensitive bypass valve with a flow area that is proportional to the speed of a vehicle (col. 1, lines 45-53). Duffy does not disclose any proportional control of fluid or how it is proportioned with respect to the described device. This is a concept added by the Examiner in the Examiner's Answer in response to Appellants pointing out deficiencies of Duffy as a reference in the Appellants' prior filed Appeal Brief arguments with respect to Appellant's claims.

In the last paragraph of section (9) on pages 5 and 6 the Examiner restates his conclusion that "At the time of the invention it would have been obvious to one of ordinary skill in the art to substitute an electromagnetic coil, plunger and control arrangement such as taught by Duffy for the hydraulic system of Fujimura et al as a control system which allows precise control of the valve system in response to multiple inputs..."

Again, Appellants maintain that this conclusion is without support from either the references cited or any other evidence. The illogic of the Examiner's position may be appreciated by looking at the references both individually and then in combination.

The Duffy reference issued as a patent in 1989 and is directed to an electronically controlled variable assist power steering system. In Figures 1, 3, and 3A, an embodiment of an "electronically controlled throttling valve 18" (col. 3, line 20 – 22) is shown. The throttling valve 18 is effective to bypass fluid from the output passage 12 of pump 10 to the pump's input passage 14 in response to the output of a CPU 22 that is in communication with a vehicle speed sensor 20, and a steering wheel torque and angle sensor 36. The valve 18 contains a solenoid 60 that surrounds a solenoid armature 62 which is connected to a slidable valve spool 44. When the solenoid 60 is energized, the valve spool 44 moves from its normally open valve position to the left and thereby restricting the communication between the passage 54, which is connected to the pump outlet 12, and passage 56 which is connected to the pump inlet 14 (col. 4, lines 27 – 36). The shape of the signal made available to the solenoid 60 is illustrated schematically in FIG. 3A. This is a pulse width modulated (pwm) electric voltage signal having two levels of voltage that cause the valve to either be open or closed. To increase the effective force acting in a left hand direction to oppose spring 58, the time of each pulse is increased so that the effective force acting in left hand direction on valve spool 44 is increased (col. 4, lines 41 – 47).

There is no discussion in Duffy of a plunger being operatively connected to the flow control valve and responsive to an applied electromagnetic field to slide the flow control valve to various positions between a fully closed position, wherein the flow control valve closes the inlet, and a fully open position, wherein maximum fluid flows from the bore to the fluid bypass port through the inlet, as is required in Appellants' claims 7 - 9. Likewise, there is no discussion in Duffy of a plunger being responsive to an applied electromagnetic field to slide the valve axially to various open positions between the fully closed position and the fully open position and to vary the position of the flow control valve to thereby vary the size of the inlet, as is called for in Appellants' claims 10 and 11.

The Examiner's response in section 10.1 (starting on page 6) contains an inaccurate statement concerning Duffy. On page 7, lines 10 and 11, the Examiner makes the statement: "Further, the valve of Duffy does not merely move between open and closed positions but rather proportionally moves to vary the bypass flow (as does Fujimura et al's)." As mentioned above, there is no disclosure in Duffy of such proportional movement. The reference clearly shows that pulse width modulation signals that switch between two voltage levels with varying time applications are used to drive the solenoid (See Fig. 3A and col. 4, lines 41 – 47).

Again, this is argued to be in contrast to Appellants' claims which require that the electromagnetic coil applies an electromagnetic field to the plunger to vary the position of the plunger and thereby vary the size of the inlet and to proportionally control fluid flow to the fluid bypass port (claims 7-9), or that the electromagnetic coil is disposed about the extension and adapted for applying an electromagnetic field to the plunger and causing it to be responsively positioned (claims 10 and 11).

In section 10.2 (page 8) the Examiner acknowledges that there has to be some motivation in the cited references or knowledge generally available to those skilled in the art to combine the teachings and support a rejection under the obviousness statute. In this case, the Examiner looks to the commonality of the references disclosing bypass steering valves and concludes that all combinations which may achieve proper flow between the pump outlet and a bypass of a positive displacement pump in a power steering system are then obvious. It is submitted that there is no motivation in either reference that would drive one skilled in the art to obviously combine those two distinct references to duplicate the claimed invention.

Also, in section 10.2 (page 8) the Examiner alleges that Appellants "...mischaracterized Fujimura et al by stating that the 'concept employed uses the principle of preventing by-pass flow when the system is at rest and only opening the by-pass flow path in response to pump fluid pressure.' ". Appellants take exception to any allegation of mischaracterization. The statement made in the Appellants' Appeal Brief was based on the description of Fig. 3 contained in the Fujimura et al reference. Specifically, "The spool valve 16, being engaged with a spring 17, is urged toward the

right side in FIG. 3, thus being abutted against a plug 18 (described later).” (col. 3, lines 42 – 44). Of course when one examines Fig. 3, it is plain to see that spring 17 is biasing the spool valve 16 to the right side against plug 18 and the bypass port 1a is restricted (closed) and not open to input port 1b. Appellants’ statement was not a mischaracterization. It was a reiteration of what is disclosed in Fujimura et al.

Further, in section 10.2 (page 8, lines 19+ and page 9 lines 1 – 2), after discussing the “concept employed” in Fujimura et al, the Examiner seems to indicate that Duffy was intended as an improvement on Fujimura et al, because “Duffy recognized that by using an electronically controlled and actuated bypass flow control valve, having the elements set forth in the claims of the instant invention, a more precise control of the power steering a system could be obtained. “ The questions Appellants ask are: More precise than what? More precise than Fujimura et al? How can that be if Duffy was known ten years prior to Fujimura et al.?

Ten years after Duffy, in 1999, Fujimura et al issued and was available to all persons skilled in this art. It has been pointed out many times during prosecution that Fujimura et al teaches away from the combination alleged by the Examiner. In view of known prior art dealing with electronically controlled power steering valves such as that disclosed ten years earlier in Duffy, the Fujimura et al authors/inventors, who were presumptively persons skilled in the art (and so admitted in section 10.5 on page 10 of the Examiner’s Answer), did not mention or even suggest that the purely hydraulic control valve they disclosed should or could be converted to an electronically controlled valve. Certainly, if the Fujimura et al authors/ inventors, who were as close as anyone to their invention and generally skilled in the art and having presumptive knowledge of Duffy, anticipated any likelihood that an electronic variation could be made, they would have mentioned it, at least as a defensive measure.

On the obviousness issue, one must also ask why, if Appellants’ invention is so obvious, there was no other art published between 1989, when Duffy issued, or from between 1999, when Fujimura et al issued, and the date of Appellants’ invention (presumably, for this discussion: July 2002) that discusses Appellants’ claimed invention. Did it become obvious when Duffy issued in 1989; or did it become obvious when

Fujimura et al issued in 1999? These are important questions, since here it appears as though the invention did not appear to be obvious until Appellants made the claims and the Examiner tried to collect pieces here and there in an attempt to support a rejection under 35 USC § 103(a). It is only the Examiner that makes this obviousness conclusion, even though the cited references, individually and in combination, do not provide the elements of the rejected claims.

In section 10.3 (page 9), the Examiner disagrees with Appellants' argument that Fujimura et al teaches away from the claimed invention. However, rather than restating that there are several combined reasons why Fujimura et al teaches away, the Examiner only focused on Appellants pointing out the failure of Fujimura et al to disclose a spring that biases a valve in an open position. Appellants also pointed out how Fujimura et al teaches away by disclosing a flow rate control device for a power steering pump that includes a hydraulic pressure reactive spool valve. Although being published 10 years after Duffy and other known electrically controlled valves, there is no mention whatsoever of a device that could be so modified away from the disclosed hydraulic device that initially maintains the valve in a closed position.

In section 10.4 (pages 9 and 10), the Examiner takes issue with Appellants noting that Fujimura et al discloses a spool valve that is elongated, but not uniform in diameter. That comment was made while attempting to describe how the Fujimura et al device functions and to show how far removed the Fujimura et al reference is from Duffy. In context it is noted that there was no attempt to relate a uniform bore limitation to Appellants' claim language.

In section 10.5 (page 10), the Examiner, for the first time during this lengthy prosecution, identified the skill level and knowledge that one skilled in the art must have. The Examiner asserts that by citing references he is relying on the skill levels of the reference author/inventors as meeting that requirement. If that is the skill level relied upon to support the Examiner's obvious combination allegation, then the Examiner's assertion reinforces Appellants arguments above (page 7), with respect to section 10.2 against the obviousness of the combination. The authors/inventors of Fujimura et al would have known that their hydraulic valve could obviously be combined with some

electronically controlled device, such as was known in Duffy, and should have stated such an obvious modification in the reference. Since the author/inventors of Fujimura et al did not mention, suggest or even hint at such a modification or substitution while having the presumed knowledge of the earlier Duffy reference, it is highly speculative on the Examiner's part to maintain an allegation of obviousness concerning Appellants claims.

In section 10.6 (page 10), the Examiner cites the case of *In re Keller* to support his argument that there does not have to be a showing of how a secondary reference may be incorporated into the structure of the primary reference in order to satisfy the test for obviousness. However, the Examiner fails to recognize the admonition found in MPEP Section 2145(c) which reads: "However, the claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose." In this case, the Examiner alleges that it would be obvious for one skilled in the art (including the Fujimura et al authors/inventors) to modify the primary reference (Fujimura et al) to incorporate the electronically controlled valve of Duffy into their device as a substitute for what is currently there. Such a modification would indeed "change the principle of operation of the primary reference".

If one were to substitute the Duffy device for the valve of Fujimura et al, several changes would have to be made to Fujimura et al which would change its principle of operation. It does not involve merely substituting a solenoid driven spool valve, but an entire system. Adding the device of Duffy, would require an electrical source and wiring. It would also require a vehicle speed sensor and an electrical steering wheel torque and angle sensor with their outputs connected to an associated CPU. The CPU would need to be programmed to react to the speed and steering wheel sensors and provide an appropriate PWM signal to the valve solenoid. The valve would be normally biased in an open condition. In contrast, the Fujimura et al device is described as a self contained control valve that relies on hydraulic pressures within the pump to achieve a balanced condition which, in turn, regulates the pump output pressure and by-pass flow back to the pump. The valve is biased in a normally closed condition. This is all achieved without the various items listed above associated with a substitution of the Duffy device. It is submitted that such a substitution would significantly change the principle of operation of

Fujimura et al, the primary reference, and is not something one skilled in the art (such as the author/inventors of Fujimura et al) would obviously perceive from the cited reference teachings.

In section 10.7 (page 11) the Examiner states that Appellants mischaracterized the rejection, for their statement on page 13 of the Appeal Brief: "Appellants submit that the broad concept of adding electrical control to a by-pass valve is not what is claimed in the application. Rather, a precise combination of interactive elements is recited in the claims and neither of the references, individually or in combination can show those claims to be a mere obvious rendering of the references." The Examiner goes on to state that: "The rejection is not merely the addition of an electrical control but is instead the substitution of an electrically actuated valve for a hydraulically actuated valve." That flawed basis for the rejection is the very thing that Appellants have been trying to point out for several months, including the immediately prior paragraph here. There is no statement, motivation, suggestion or hint that the valve of Duffy should or even could be substituted for that shown and described in Fujimura et al, except for the Examiner's hindsight attempt to reconstruct Appellants' claimed invention.

Finally, so as not to get lose sight of one of Appellants' main arguments among the various responses here and in prior submitted papers, Appellants wish to once again state it here. Even if one were to determine that the Duffy device is substitutable into Fujimura et al device as an obvious act, doing so will not render or provide evidentiary support for the rejection of the claimed invention. As pointed out on page 12 of Appellants' Appeal Brief, Duffy teaches an electronically controlled throttling valve in which pwm signals are applied to an electromagnetic coil to axially adjust the valve to its predetermined open and closed positions. The effect of pwm signals is to vary the times between open and closed to correspondingly adjust the degree of restriction between the input and output passages of the valve. The throttle valve of Duffy does not perform the same functions of the claimed invention because Duffy discloses a solenoid driven valve that has two states or positions: open and closed. There is no suggestion of a valve that is controlled to various positions between its fully open and fully closed positions, as set forth in Appellants' rejected claims.

Conclusion

For each of the reasons discussed above, including the failure of the cited references to support the rejections under 35 USC §103(a), Appellants again request this Honorable Board to reverse the rejection of the claims by the Examiner and to hold allowable all claims under consideration in the application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Paul K. Godwin", written over a horizontal line.

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Date: November 3, 2008
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